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| 09/917,504      | 07/27/2001  | Karl-Heinz Schuster  | (Z) 99069 P US      | 6246             |

7590 05/29/2003  
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EXAMINER

RAIZEN, DEBORAH A

ART UNIT PAPER NUMBER

2873

DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/917,504

Applicant(s)

SCHUSTER ET AL.

Examiner

Deborah A. Raizen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 11, 17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other:

## DETAILED ACTION

### *Priority*

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Germany on November 30, 1998, May 14, 1999, and April 9, 1999. It is noted, however, that applicant has not filed a certified copy of the four German applications, 198 55 108.8, 198 55 157.6, 199 22 209.6, and 199 42 281.8, as required by 35 U.S.C. 119(b).

The following is a quote from the MPEP (Revision 1 to the Eighth Edition, February 2003, which can be accessed at the Web site <http://www.uspto.gov/web/offices/pac/mpep/> [click on the box marked E8R1-1800-PDF in the 1800 line) section 1895.01 (II), page 1800-163:

A certified copy of any foreign priority document must be provided by the applicant if the parent international application has not entered the national stage under 35 U.S.C. 371 (the photocopy received from the International Bureau cannot be used).

Also, please submit a certification from applicant that neither the international application nor the designation of the United States was withdrawn or considered to be withdrawn prior to the filing date of the U.S. national (35 U.S.C. 111(a)) application (see MPEP section 1895).

### *Specification*

2. The disclosure is objected to because of the following informalities:

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The following entries in the tables differ from the corresponding values in the international application PCT/EP99/09235 published as WO 00/33138:

in Table 1, the radii of element 42, and the second radius of element 47;

in Table 2, the second radii of each of elements L225 and L226, and the thickness of L230;

in Table 3, the second radius of L314 and the thickness of L321.

If these values are in error, applicants should correct them.

In Tables 2 and 3, it is not clear what the letter A, before some of the entries in the Thickness column, means.

Appropriate correction is required.

### ***Claim Objections***

3. Claim 10, 14, and 18 are objected to because of the following informalities:

In claim 10, the limitation "before the pupil plane" appears to contradict Fig. 8 and the disclosure on page 15, paragraph 0063.

In claim 14, it is not clear whether the crystals comprise all the listed salts or any of them.

Claim 18 recites "The process according to claim 16," but claim 16 is not directed to a process. Claim 18 should depend on claim 17 instead.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 9 recites the limitation "at least three of the positive lenses" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. In particular, the claim (or its base claim) needs to make clear that the positive lens elements are of the lens group of the third bulge, as the claim implies.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 10, and 12-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Matsuyama (6,198,576). In regard to claim 1, Maruyama discloses a microlithographic projection lens (first embodiment, Figures 3 and 13 and Table 1) having a system diaphragm (aperture stop) arranged in a region of a last bulge on an image side (between lens elements L51 and L59), and having an image-side numerical aperture of more than 0.65 (0.68, col. 6, lines 53-54) and an image field diameter of more than 20 mm (26.4 mm, col. 6, lines 55-56), wherein a

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pupil plane is curved over a cross section of a pencil of rays by a maximum of 20 mm (col. 4, lines 27-38 and col. 10, lines 6-10; although Matsuyama does not explicitly disclose the curvature, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 2, in the Matsuyama microlithographic projection lens, the pupil plane is curved by a maximum of less than 15 mm (col. 4, lines 27-38 and col. 10, lines 6-10; although Matsuyama does not explicitly disclose the curvature, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 3, Matsuyama discloses a microlithographic projection lens (Figures 3 and 13 and Table 1) having a system diaphragm (aperture stop) arranged in a region of a last bulge on an image side (between lens elements L51 and L59), and having an image-side numerical aperture of more than 0.65 (0.68, col. 6, lines 53-54) and an image field diameter of more than 20 mm (26.4 mm, col. 6, lines 55-56), wherein the lens has a telecentricity deviation of less than  $\pm 4$  mrad of a geometric central beam, on stopping down to 0.8 times said image-side numerical aperture (col. 5, lines 66-67 and col. 6, lines 1-2 and abstract, last two lines; although Matsuyama does not explicitly disclose the telecentricity deviation upon stopping down, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 4, in the Matsuyama microlithographic projection lens, the telecentricity deviation is less than  $\pm 3$  mrad (col. 5, lines 66-67 and col. 6, lines 1-2 and abstract, last two lines; although Matsuyama does not explicitly disclose the telecentricity deviation upon stopping down, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 5, as understood, Matsuyama discloses a microlithographic projection lens (Figures 3 and 13 and Table 1) having a system diaphragm (aperture stop) arranged in a region of a last bulge on an image side (between lens elements L51 and L59), and having an image-side numerical aperture of more than 0.65 (0.68, col. 6, lines 53-54) and an image field diameter of more than 20 mm (26.4 mm, col. 6, lines 55-56), wherein a tangential image dishing of a pupil image in a diaphragm space is corrected to less than 20 mm (col. 4, lines 27-38 and col. 10, lines 6-10; although Matsuyama does not explicitly disclose the tangential image dishing of a pupil image in a diaphragm space, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 6, in the Matsuyama microlithographic projection lens, the tangential image dishing of the pupil image in the diaphragm space is corrected to less than 15 mm (col. 4, lines 27-38 and col. 10, lines 6-10; although Matsuyama does not explicitly disclose the tangential image dishing of a pupil image in a diaphragm space, a calculation that uses the values in Table 1 would show that the Matsuyama projection lens meets this limitation).

In regard to claim 7, in the Matsuyama projection lens, a first negative lens that follows the pupil plane in a beam path (lens element L54) is a meniscus (the first surface is concave and the second surface is convex) that is concave on a pupil side (the first surface is concave toward the pupil, which is defined by applicants and by Matsuyama to be located at the aperture stop).

In regard to claim 8, in the Matsuyama projection lens, a lens group of negative refractive power is arranged at each waist (G2 and G4), and a lens group of positive refractive power is arranged at each bulge (G1, G3, and G5), and wherein at least two positive lenses of a lens group of a third bulge are arranged before the pupil plane (lens elements L51 and L52).

In regard to claim 10, as understood, in the Matsuyama projection lens, at least one spherically overcorrecting air space is arranged between adjacent lenses (L53 and L54) in a region of a third bulge before the pupil plane (as understood from applicants' specification and figures).

In regard to claim 12, in the Matsuyama projection lens, a second waist (G2) comprises only spherical lenses (Table 1: all the lens elements in the Matsuyama projection lens are spherical).

In regard to claim 13, in the Matsuyama projection lens, quartz glass and fluoride crystals, individually or in combination, are used as lens material (Table 1, last column, and col. 6, line 46; col. 10, lines 28-30).

In regard to claim 14, as understood, in the Matsuyama projection lens, the crystals comprise particularly  $\text{CaF}_2$ ,  $\text{BaF}_2$ ,  $\text{SrF}_2$ ,  $\text{LiF}$  (col. 10, lines 28-30).

In regard to claim 15, the Matsuyama projection lens has two waists (G2 and G4) and three bulges (G1, G3, and G5).

In regard to claim 16, Matsuyama discloses a microlithographic projection exposure device (Fig. 2 and col. 3, lines 38-67) comprises a projection lens (PL; col. 3, lines 50-51), such as the first embodiment (col. 4, lines 1-2).

### ***Double Patenting***

8. Applicant is advised that should claims 1 and 2 be found allowable, claims 5 and 6 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim 5 is a duplicate of claim 1 because the claims are identical except for their last limitation. However, the term "the tangential image dishing of the pupil image in the diaphragm space" (in the last limitation of claim 5) is not defined in the specification to have a meaning other than the same meaning as "a pupil plane is curved over a cross section of a pencil of rays" (in the last limitation of claim 1). Claim 6 is a duplicate of claim 2 for the same reason.

*Allowable Subject Matter*

9. Claims 11, 17 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of claims 11, 17 and 18, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper.

11. The prior art fails to teach a combination of all the features in claim 11. For example, these features include the detailed structure and limitations recited in claim 1 and also a lens with an aspheric surface arranged before a first waist. The references of record that have aspherical surfaces have them in the fourth or fifth lens group. "A first waist" is understood to mean first from the object, or reticle, side.

Claim 17 depends on claim 11 and therefore has allowable subject matter as well.

Claim 18, when it is corrected to depend on claim 17, will depend on claim 11 and will therefore have allowable subject matter as well.

12. Claim 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter:

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of claim 9, in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the features in claim 9. For example, these features include the detailed structure and limitations recited in claims 1 and 8 and also a third positive lens element of the lens group of the third bulge arranged before the pupil plane. Matsuyama and Shigematsu (cited in the conclusion) have only two. The term "lenses" is understood to mean lens elements, and the pupil plane is understood to be located at the aperture stop or diaphragm.

### *Conclusion*

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Mercado (5,986,824), Shigematsu (6,259,508 B1), and Yamaguchi et al. (6,008,884) disclose some of the limitations of base claims 1, 3, and 5 (as well as limitations of other claims). The limitations not explicitly disclosed, such as deviation from telecentricity upon stopping down and curvature of the pupil plane, might be found to be disclosed with a calculation based on the disclosed lens parameters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah A. Raizen whose telephone number is (703) 305-7940. The examiner can normally be reached on Monday-Friday, from 8 a.m. to 4:30 p.m. EST.

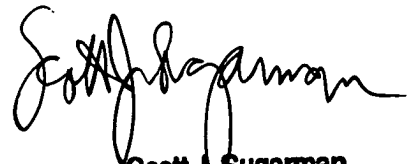
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (703) 308-4883. The fax phone numbers for the

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organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

dar  
May 16, 2003



Scott J. Sugarman  
Primary Examiner